

## CLAIMS

1. A laser frequency discriminator that detects a difference between two laser frequencies to produce, said first and second paths having respectively a first and second optical length, said first and second optical length being different optical lengths in value, thereby a difference output signal and which comprises:

a means for splitting an input laser beam with two frequencies into a first and second path; a photo detector which is on the first path and produces a detection output signal by processing signals therefrom;

a photodiode which is on the second path and which produces a photodiode output signal by processing signals therefrom;

a phase detector which compares phases of the photodiode output signal with the detection output signal to produce thereby the difference output signal.

2. A laser frequency discriminator, as defined in claim 1, wherein said first and second optical paths respectively comprise a first and second optical fiber which have different lengths.

3. A laser frequency discriminator, as defined in claim 1 wherein said discriminator has an optimum frequency difference and further including an electro-optical phase shifter to tune the optimum frequency difference by shifting the phase delay between the two laser frequencies.

4. A laser frequency discriminator, as defined in claim 3, uses feedback to stabilize the frequency difference between two laser frequencies.